

Claims

[c1] What is claimed is:

1.A voltage clamper for adjusting an input voltage to generate an output voltage, the voltage clamper comprising:

a bias circuit for generating at least one bias voltage according to the input voltage;

a voltage drop circuit for controlling the input voltage to generate a voltage drop; and

a voltage detection circuit electrically connected to the voltage drop circuit and the bias circuit for adjusting the voltage drop generated from the voltage drop circuit according to the bias voltage to generate the output voltage.

[c2] 2.The voltage clamper of claim 1 wherein the voltage drop circuit comprises:

a predetermined voltage drop unit electrically connected to an output terminal of the voltage clamper and the input voltage for applying a predetermined voltage drop to the input voltage to adjust the output voltage; and

a first voltage drop unit electrically connected to the output terminal of the voltage clamper and the input

voltage for applying a first voltage drop to the input voltage to adjust the output voltage;
wherein the predetermined voltage drop unit is always activated, and the activation of the first voltage drop unit is controlled by the voltage detection circuit.

[c3] 3.The voltage clamper of claim 2 wherein the voltage detection circuit comprises:

a first voltage detection unit electrically connected to the first voltage drop unit for controlling the first voltage drop unit to adjust the output voltage.

[c4] 4.The voltage clamper of claim 3 wherein the bias circuit comprises:

a first bias unit electrically connected to the first voltage detection unit for generating a first bias voltage according to the input voltage and for providing the first bias voltage to the first voltage detection unit;
wherein the first voltage detection unit controls the first voltage drop unit to adjust the output voltage according to the first bias voltage and a first predetermined voltage level.

[c5] 5.The voltage clamper of claim 4 wherein the first voltage detection unit triggers the first voltage drop unit to adjust the output voltage when the first bias voltage is smaller than the first predetermined voltage level.

- [c6] 6.The voltage clamper of claim 4 wherein the voltage drop circuit further comprises:
a second voltage drop unit electrically connected to the output terminal of the voltage clamper and the input voltage for triggering the output voltage to be approximately equal to the input voltage;
wherein the activation of the second voltage drop unit is controlled by the voltage detection circuit.
- [c7] 7.The voltage clamper of claim 6 wherein the voltage detection circuit further comprises:
a second voltage detection unit electrically connected to the second voltage drop unit for controlling the second voltage drop unit to adjust the output voltage.
- [c8] 8.The voltage clamper of claim 7 wherein the bias circuit further comprises:
a second bias unit electrically connected to the second voltage detection unit for generating a second bias voltage according to the input voltage and for providing the second bias voltage to the second voltage detection unit;
wherein the second voltage detection unit controls the second voltage drop unit to adjust the output voltage according to the second bias voltage and a second predetermined voltage level.

- [c9] 9.The voltage clamper of claim 8 wherein the second voltage detection unit triggers the second voltage drop unit to adjust the output voltage when the second bias voltage is smaller than the second predetermined voltage level.
- [c10] 10.The voltage clamper of claim 8 wherein the first voltage detection unit comprises a first adjusting module for setting the first predetermined voltage level, and the second voltage detection unit comprises a second adjusting module for setting the second predetermined voltage level.
- [c11] 11.The voltage clamper of claim 8 wherein the first bias voltage is equal to the second bias voltage.
- [c12] 12.The voltage clamper of claim 8 wherein the first predetermined voltage level is equal to the second predetermined voltage level.
- [c13] 13.The voltage clamper of claim 2 wherein the first voltage drop is smaller than the predetermined voltage drop.
- [c14] 14.The voltage clamper of claim 2 further comprising a capacitor module electrically connected to the output terminal of the voltage clamp.
- [c15] 15.The voltage clamper of claim 14 wherein the capaci-

tor module comprises an N-type metal-oxide-semiconductor transistor, a gate and a drain of the N-type metal-oxide-semiconductor transistor are electrically connected to the output terminal of the voltage clamper, and a source of the N-type metal-oxide-semiconductor transistor is electrically connected to a ground voltage.

- [c16] 16. A voltage adjusting method for generating an output voltage by adjusting an input voltage comprising:
- (a) setting a plurality of voltage segments corresponding to a plurality of different voltage drop setting values; and
 - (b) utilizing one of the voltage drop setting values to trigger a voltage difference between the output voltage and the input voltage corresponding to the voltage drop setting value when the input voltage is within one of the voltage segments.
- [c17] 17. The method of claim 16 wherein step (a) further comprises setting the voltage drop setting value of a first voltage segment to be greater than the voltage drop setting value of a second voltage segment if a minimum voltage of the first voltage segment is greater than a maximum voltage of the second voltage segment.